Space Weather Forecast

Issued on Friday, 30 September 2022 at 13:15 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: G1-G2/Minor-Moderate geomagnetic storms expected day 1 until day 3. Chance of G3/Strong storm from CME arrival day 2. Moderate solar activity considered Likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate with a single Moderate class flare at 30/0401 UTC, which appears to have originated from the northeast limb, close to the NEW region which has recently rotated into view. This region is the source of increased activity over recent days and is expected to the be the most active region on the disk in coming days. There are currently four numbered sunspots on the visible disc, two of which are moderate in size and complexity and two of which are smaller and simple.

Solar Wind / Geomagnetic Activity: Solar wind parameters were indicative of continued high speed stream influence, with an embedded transient. Solar wind speeds, as measured by DSCOVR at L1, were on a declining trend from elevated to slightly elevated before briefly peaking near strong around 30/0600 UTC. The total Interplanetary magnetic field strength started weak, then became moderate after 30/0430 UTC. The north-south component was weak initially, then increased after 30/0430 UTC with increasing periods in the negative orientation. Geomagnetic activity during 29th was Quiet (Kp 0 to 2), then became Unsettled to Active (Kp 3-4) during 30th.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at or near normal background levels, and well below the level of a solar radiation storm.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be Moderate with isolated Moderate-class flares considered likely.

Solar Wind / Geomagnetic Activity: The coronal mass ejection from the filament eruption on 28/0400 UTC has the potential to move across Earth tomorrow (1st). Solar winds are expected to be steady at first today, around elevated levels, before the next fast wind enhancements arrive later today and also tomorrow, then persisting through days 3 and 4 (2nd and 3rd). Quiet geomagnetic activity at first, with possible isolated Unsettled intervals. Then geomagnetic activity is expected to increase later today to Minor to Moderate storm levels. Activity levels may increase further tomorrow from any coronal mass ejection arrival, with a chance of isolated Strong Storms intervals. Activity easing to Quiet to Unsettled by late day 4 (3rd).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to persist close to background levels with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	80	80	70	30
Strong	G3	No	20	30	10	1
Severe	G4	No	1	5	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	60	60	60	60
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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